

Figure 1 A

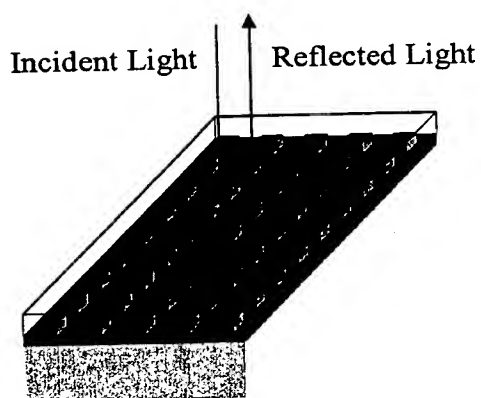


Figure 1 B



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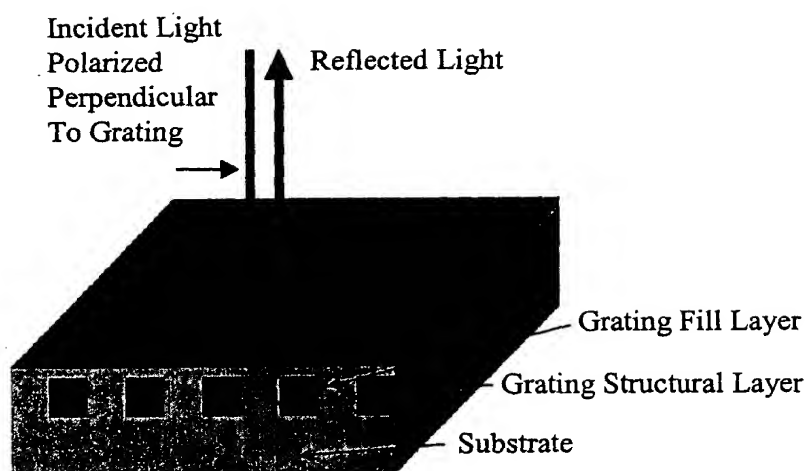


Figure 2



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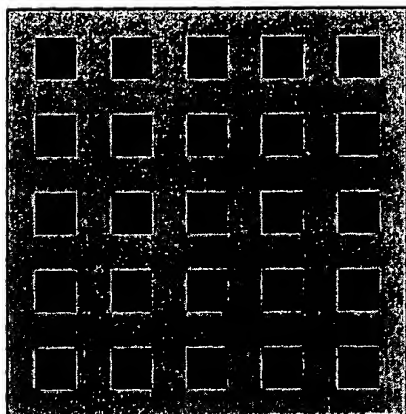


Figure 3A

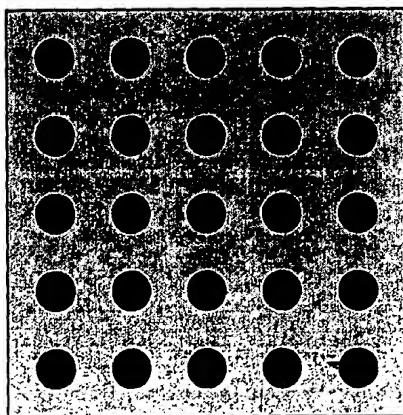


Figure 3B

2011-01-25 08:55:00



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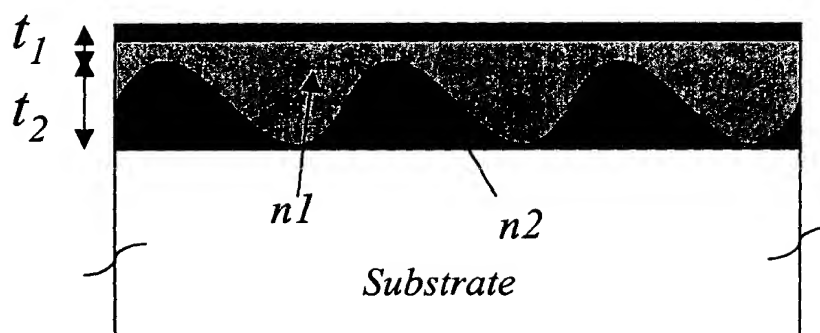


Figure 4



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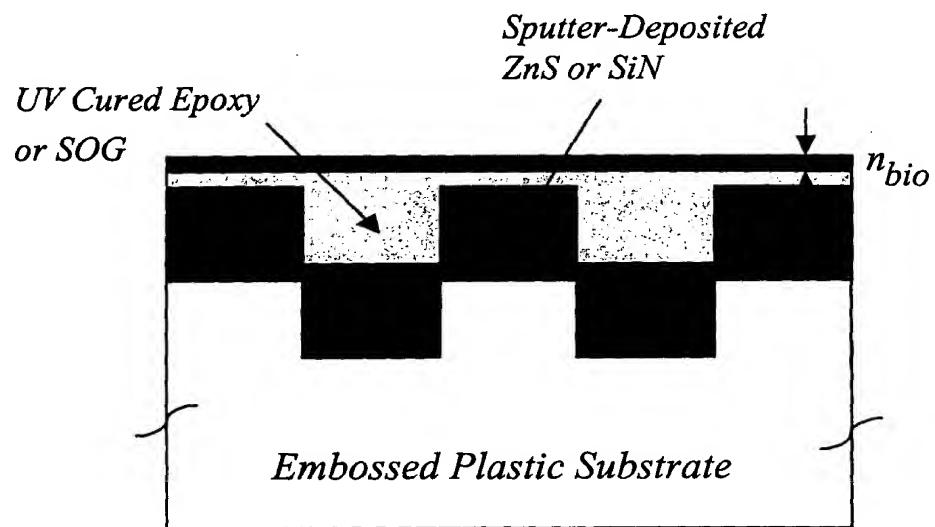


Figure 5



009035-0110

### Amine

- Sulfo-succinimidyl-6-(biotinamido)hexanoate (Sulfo-NHS-LC-Biotin)
  - Streptavidin / avidin then biotinylated molecule
- N,N'-disuccinimidyl carbonate (DSC); • -NH<sub>2</sub>, non-cleavable
- Dimethyl pimelimidate (DMP); • -NH<sub>2</sub>, non-cleavable
- Dimethyl 3,3'-dithiobispropionimidate (DTBP); • -NH<sub>2</sub>, cleavable
- 1-Ethyl-3-(3-Dimethylaminopropyl)carbodiimide Hydrochloride (EDC) and N-Hydroxysulfosuccinimide (Sulfo-NHS); • -COOH
- Sulfo-succinimidyl 6-[α-methyl-α-(2-pyridyl-dithio)toluamido] hexanoate (Sulfo-LC-SMPT); • -SH, cleavable
- N-(B-Maleimidopropoxy)succinimide ester (BMPS)
  - -SH<sub>2</sub>, non-cleavable
- Sulfo-succinimidyl 4-[N-maleimidomethyl]cyclohexane-1-carboxylate (Sulfo-SMCC); • -SH, non-cleavable

### Aldehyde

- Directly with aldehyde or first amino then aldehyde
  - -NH<sub>2</sub>

### Ni(II)

- Using Nitrilotriacetic acid (NTA) group, which forms a chelate with Ni(II)
  - His-tagged molecules

Figure 6

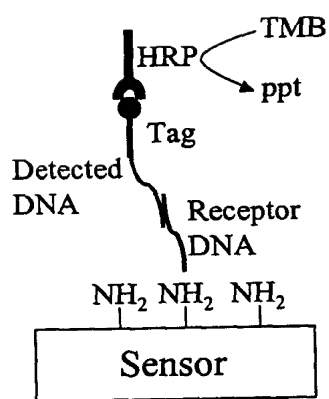


Figure 7A

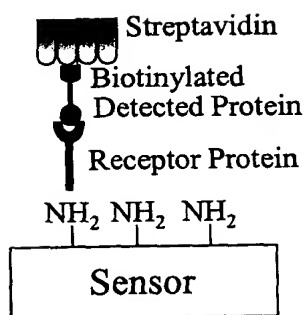


Figure 7B

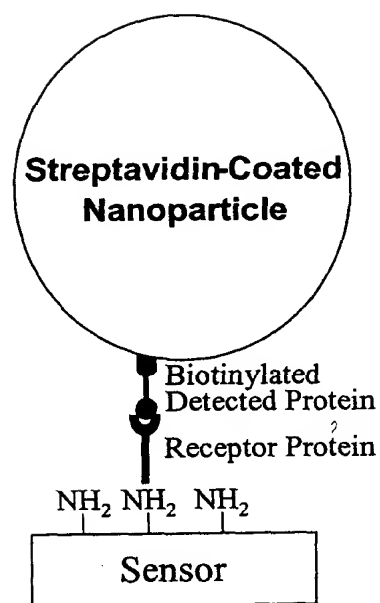


Figure 7C

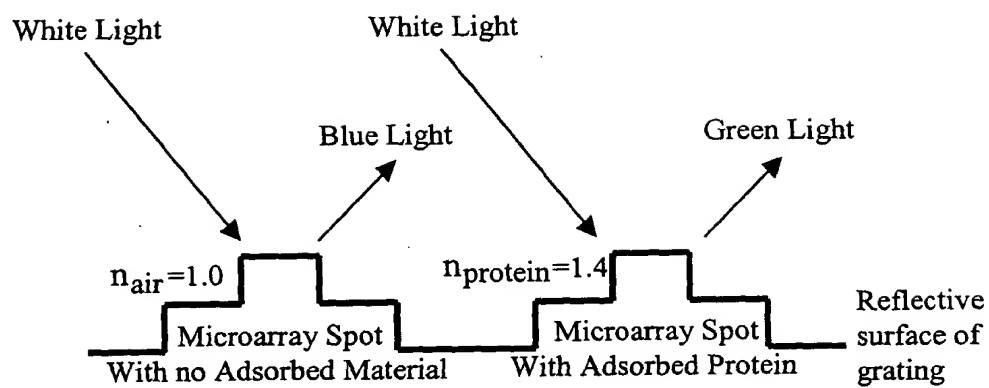


Figure 8

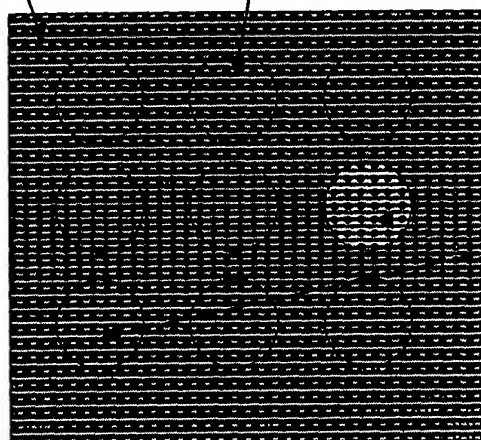




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Grating structure

Microarray location  
without affinity-adsorbed  
molecules



Microarray  
locations with  
affinity-adsorbed  
molecules

Figure 9



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□ Microtiter plate

□ Microarray slide

Plastic bottomless microtiter plate.  
Holes in plate are open from top to bottom

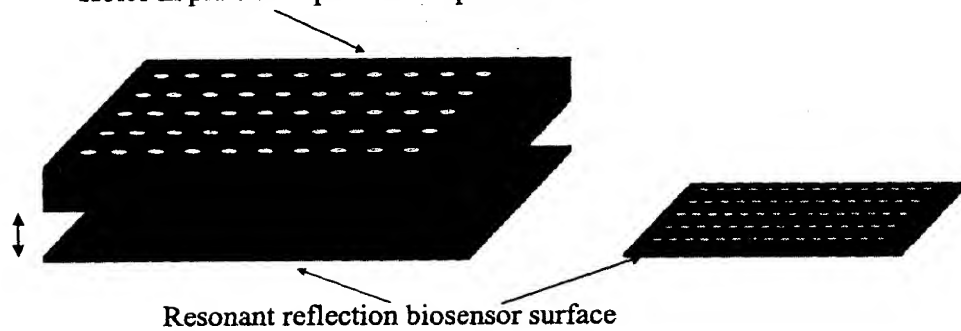


Figure 10A

Figure 10B

1 mm<sup>2</sup> chip  
with 50 spots

- Dip into 96-well plate
- Perform 4800 assays

- Dip into 96-well plate
- Perform 4800 assays

Figure 11

[illegible]



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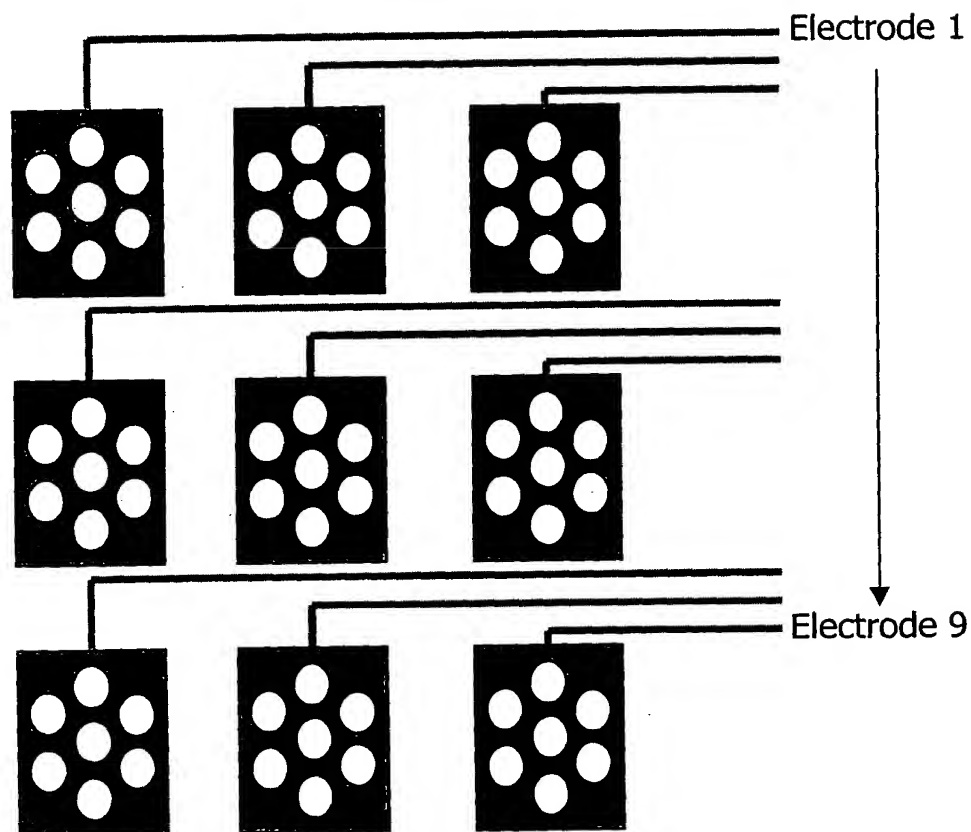
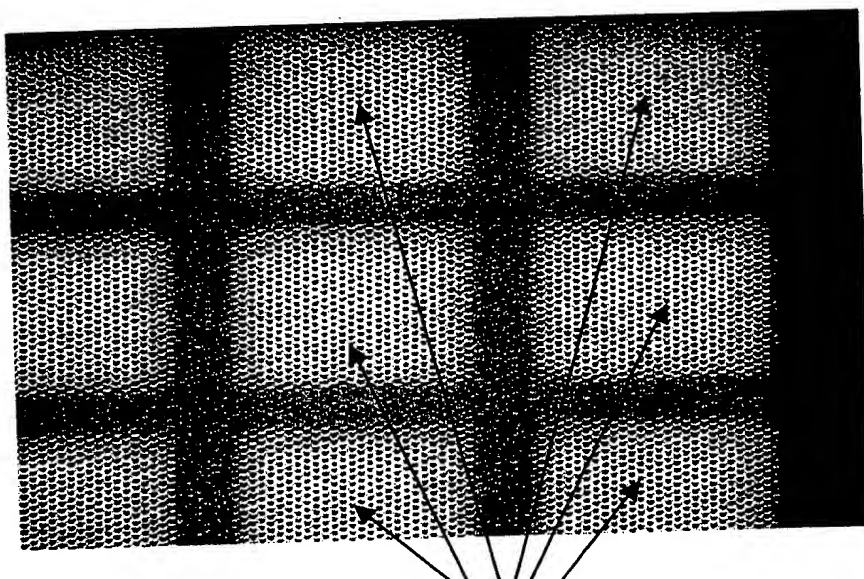


Figure 12



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Separate electrode grating regions

Figure 13

00930352 034402

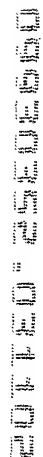


Figure 14



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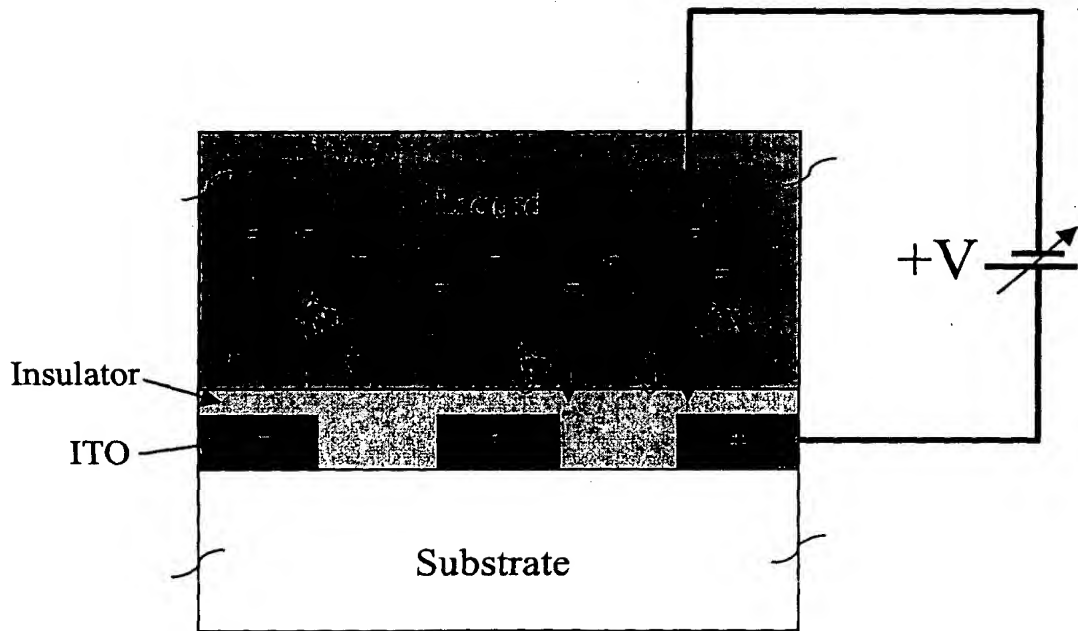


Figure 15



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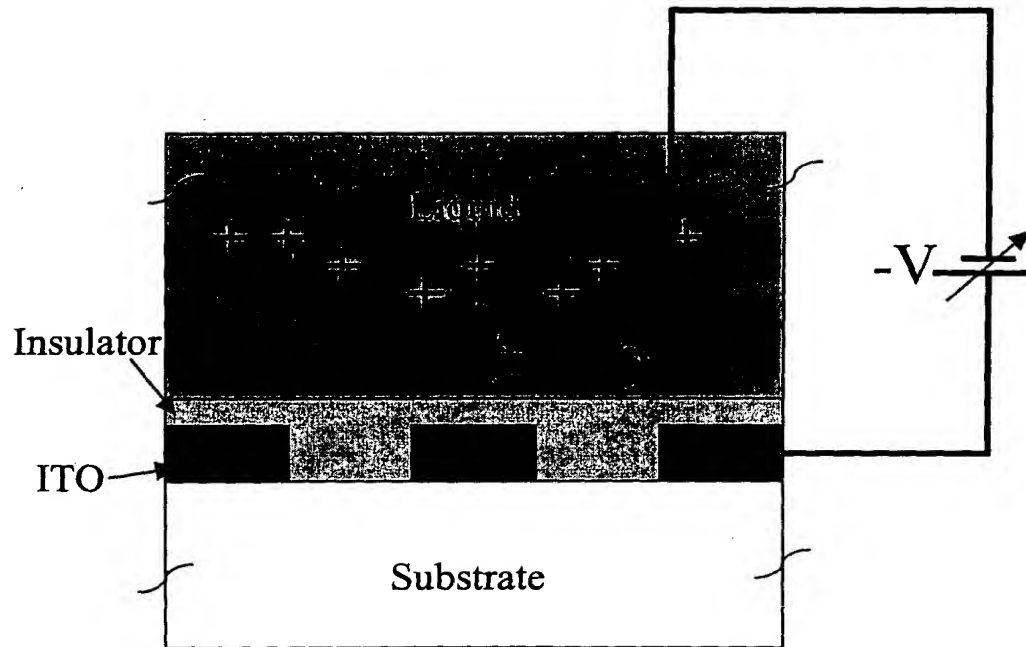


Figure 16

0993055-03100



Figure 1 shows a schematic representation of the 12 genes and their corresponding cDNA clones. The genes are arranged in two columns. The left column contains genes 1 through 10, and the right column contains genes 11 and 12. Each gene is represented by a box with its name and a diagram of its exon-intron structure. The cDNA clones are shown as linear sequences of nucleotides, with the gene name and a unique identifier (e.g., 1-1, 1-2, etc.) next to each sequence.

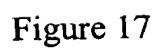


Figure 17

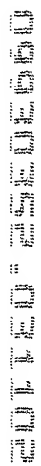


Figure 18



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### Peak Wavelength

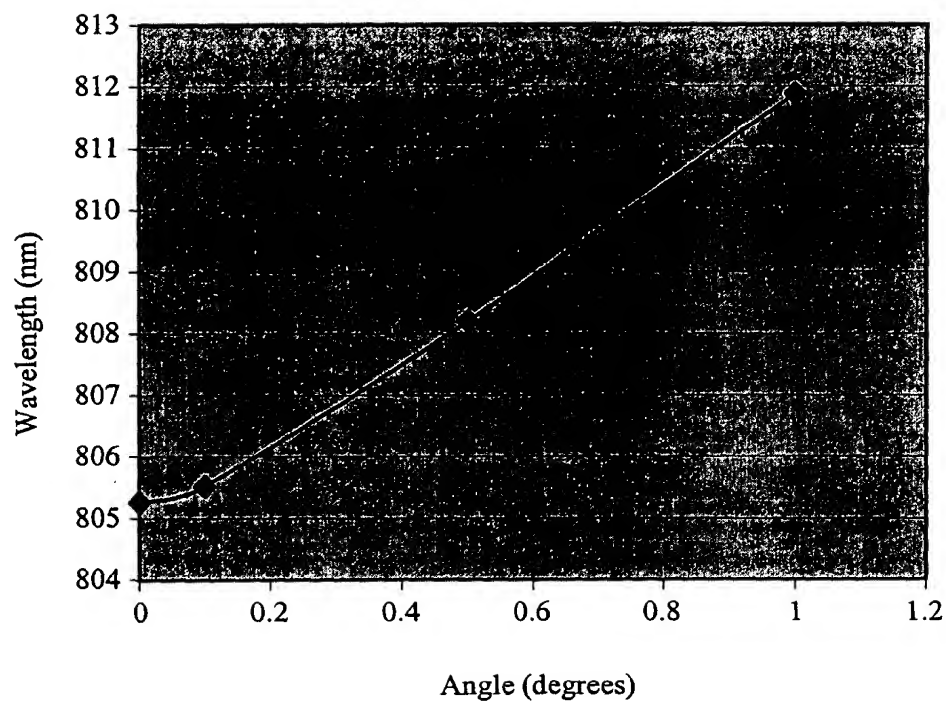


Figure 19

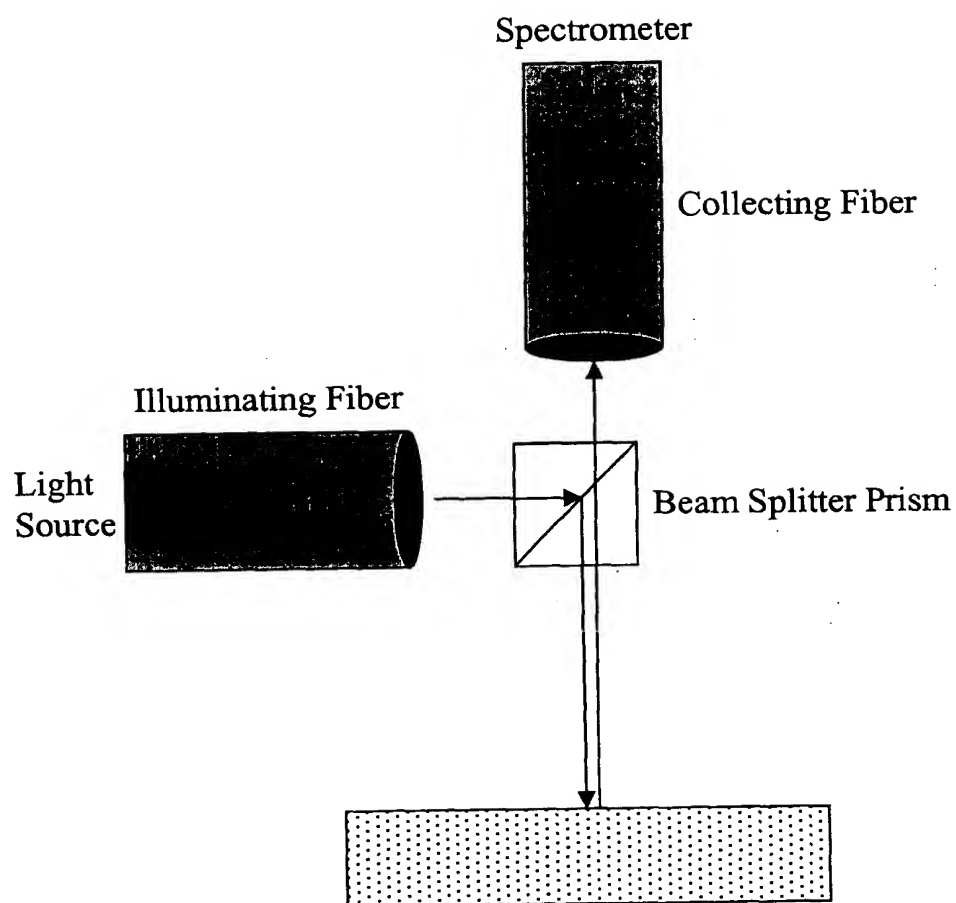


Figure 20

0093032-03403





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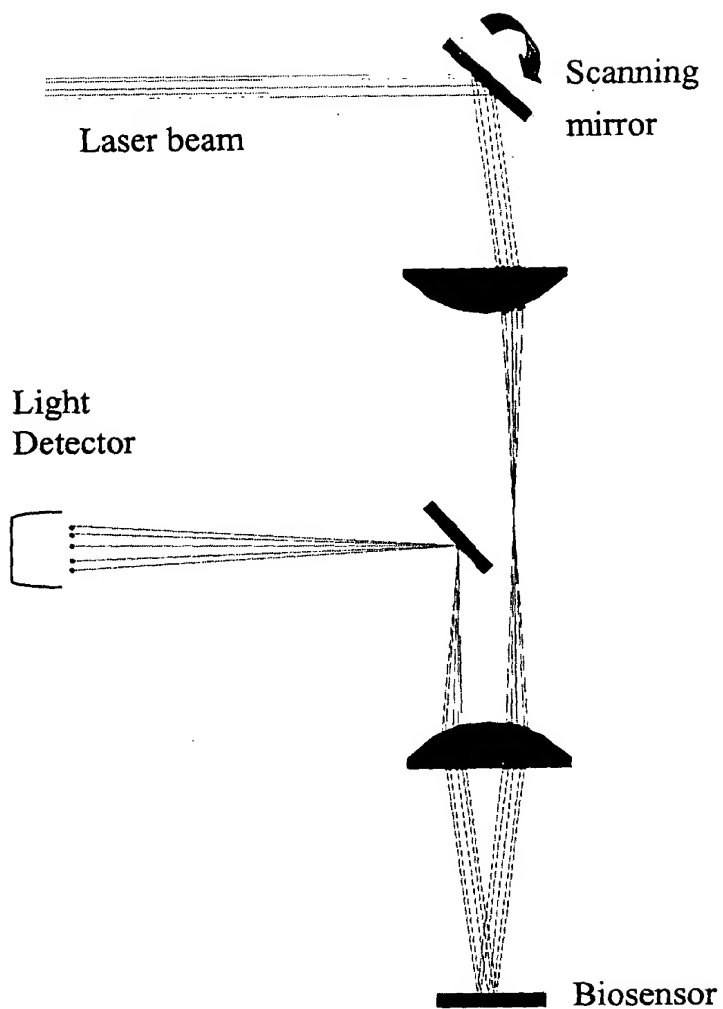


Figure 21

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201700 25000000

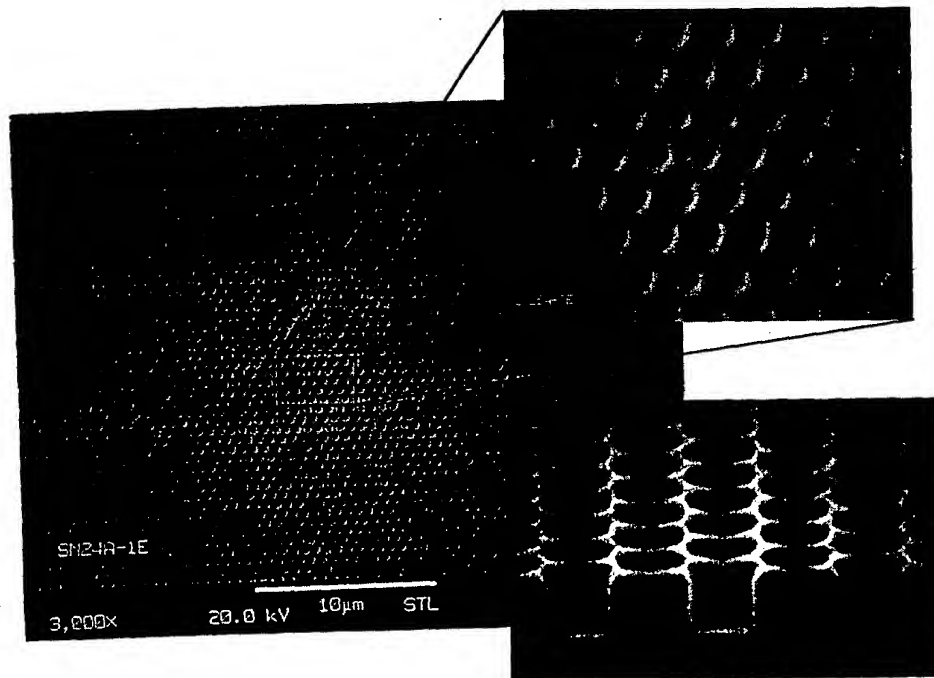


Figure 22



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201110 25000000

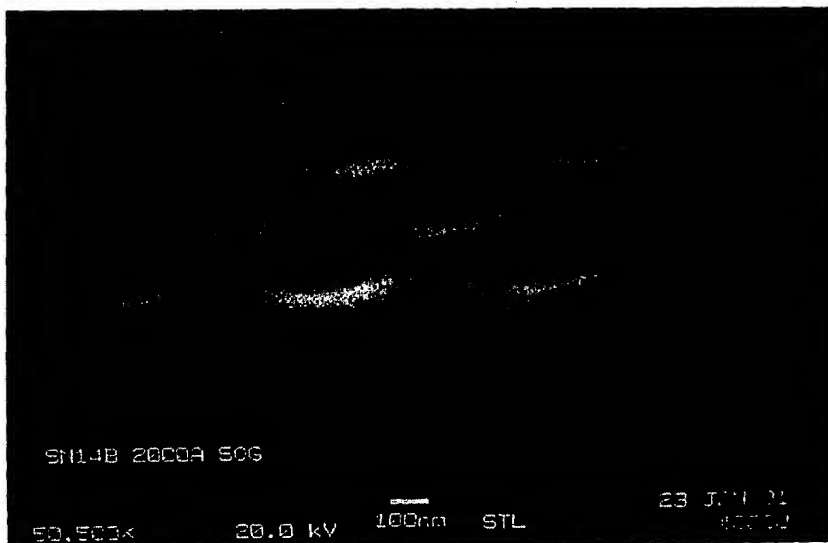


Figure 23



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00930355-034402

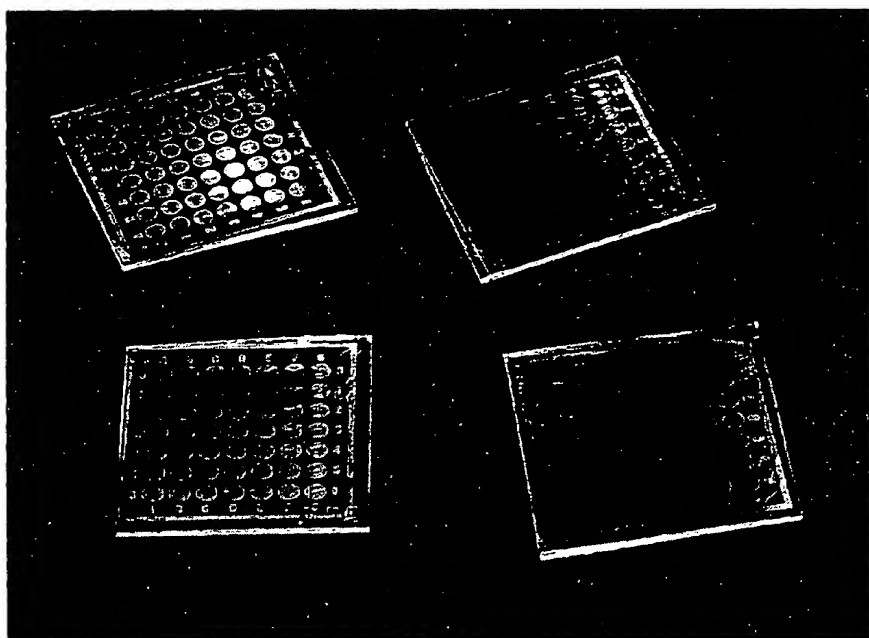


Figure 24





## Albumin Deposition on Resonant Reflector

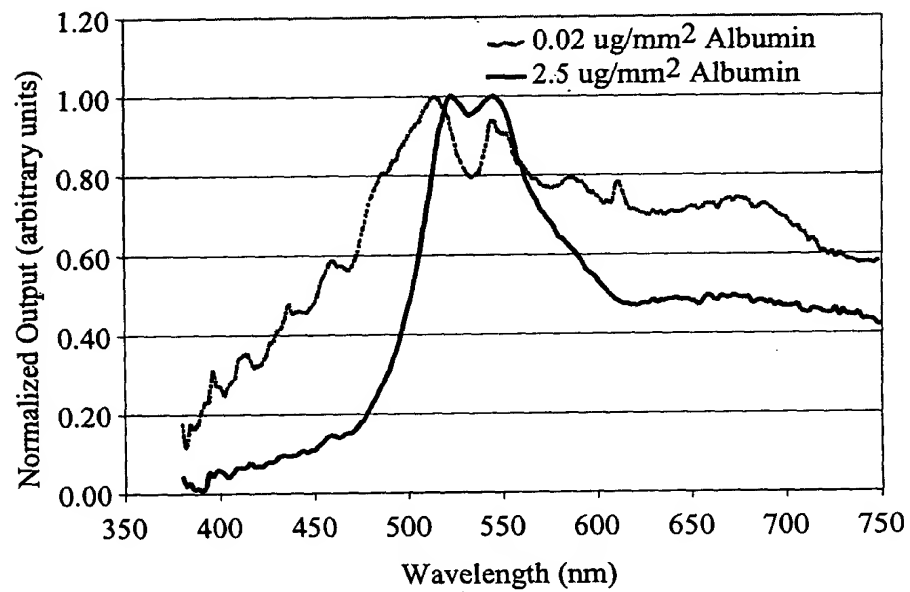
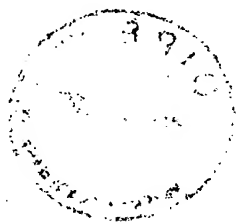


Figure 25



## Resonant Reflector Measured in Water

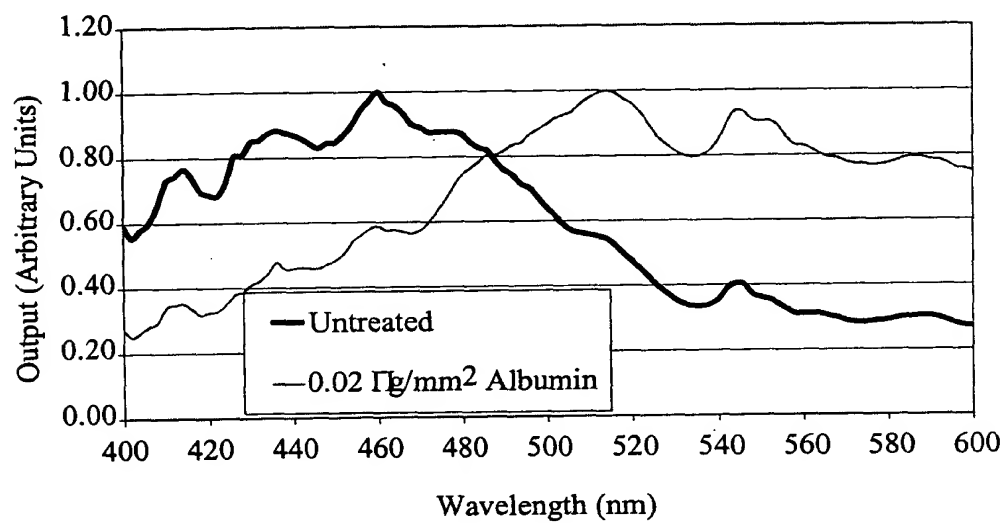


Figure 26



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### Bacteria immobilization on structure

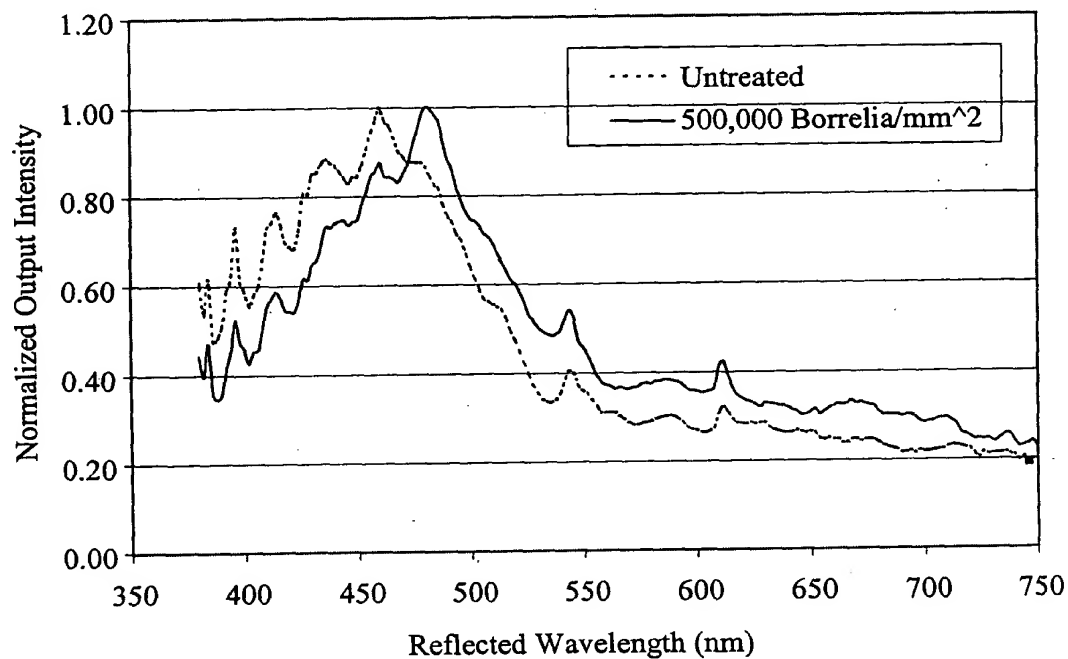


Figure 27



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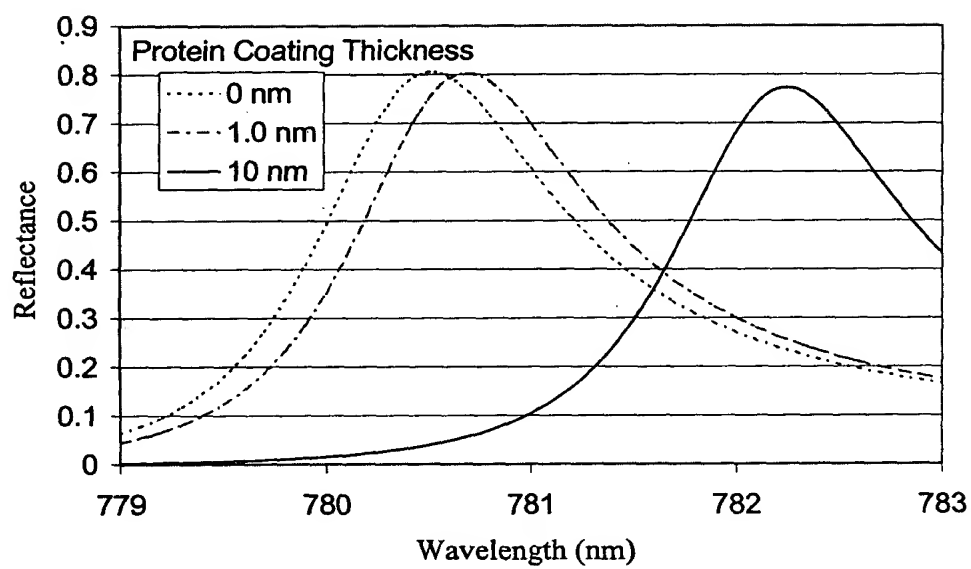


Figure 28

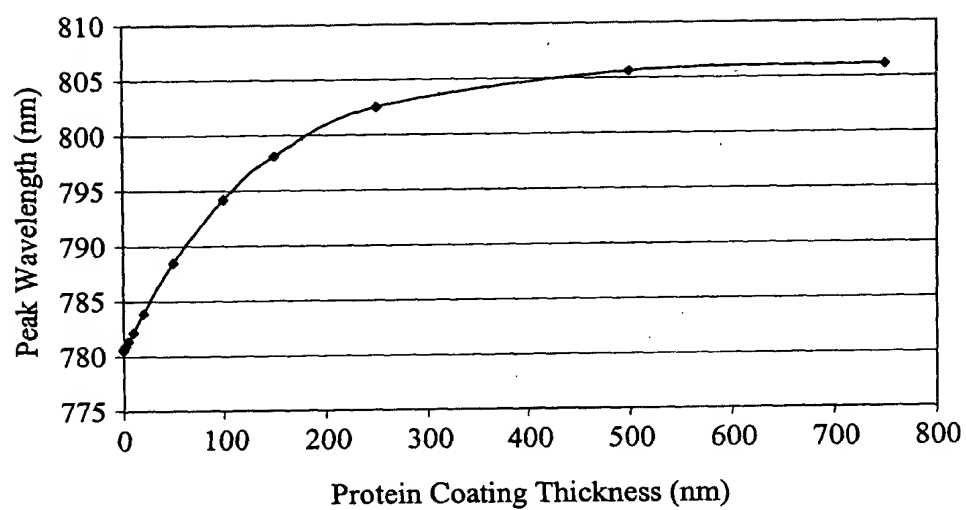


Figure 29



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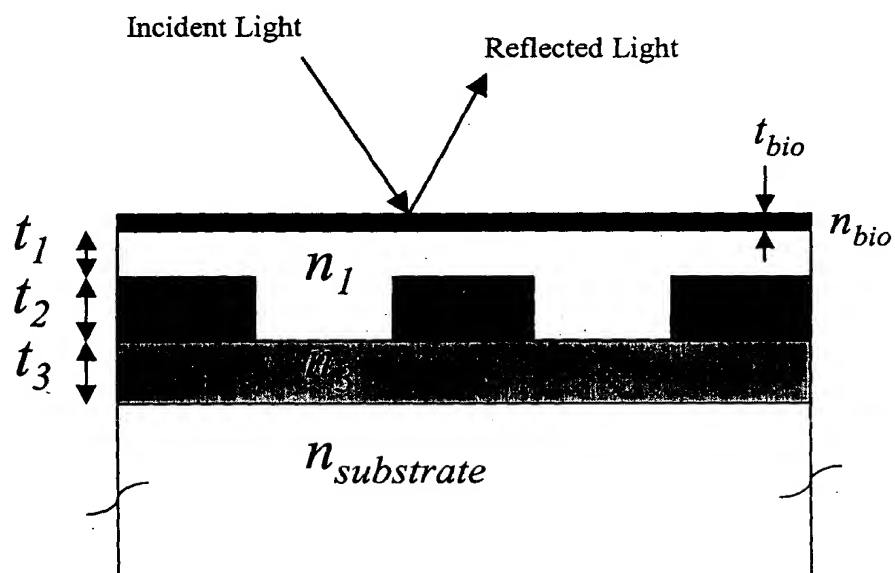
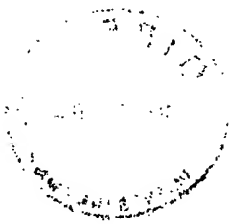


Figure 30



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### Reflected Resonance with Deposited Protein

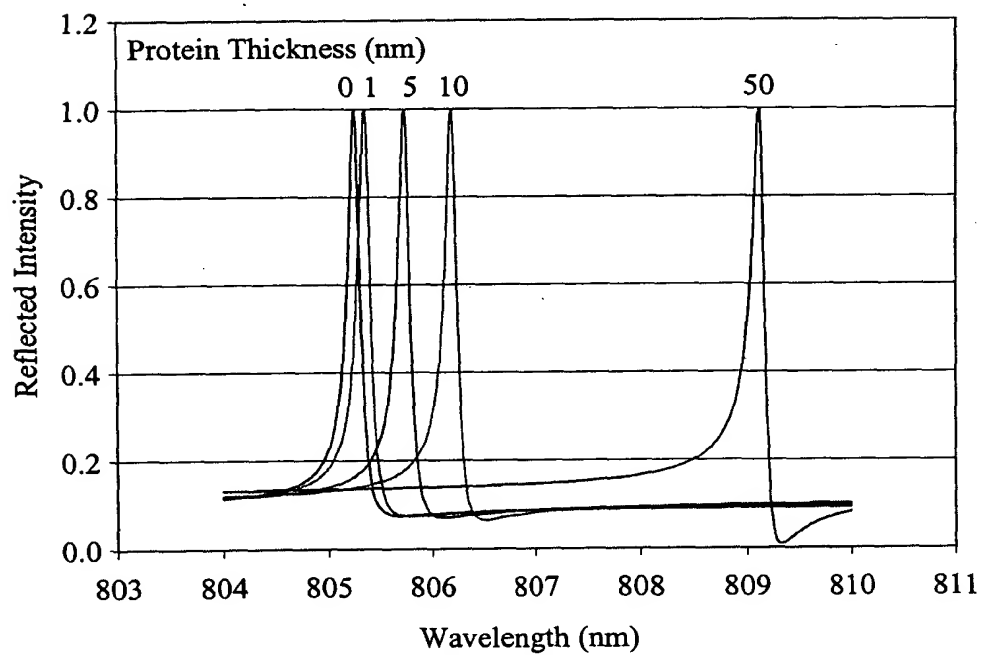


Figure 31



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### Resonant Peak Wavelength Dependence on Deposited Protein Thickness

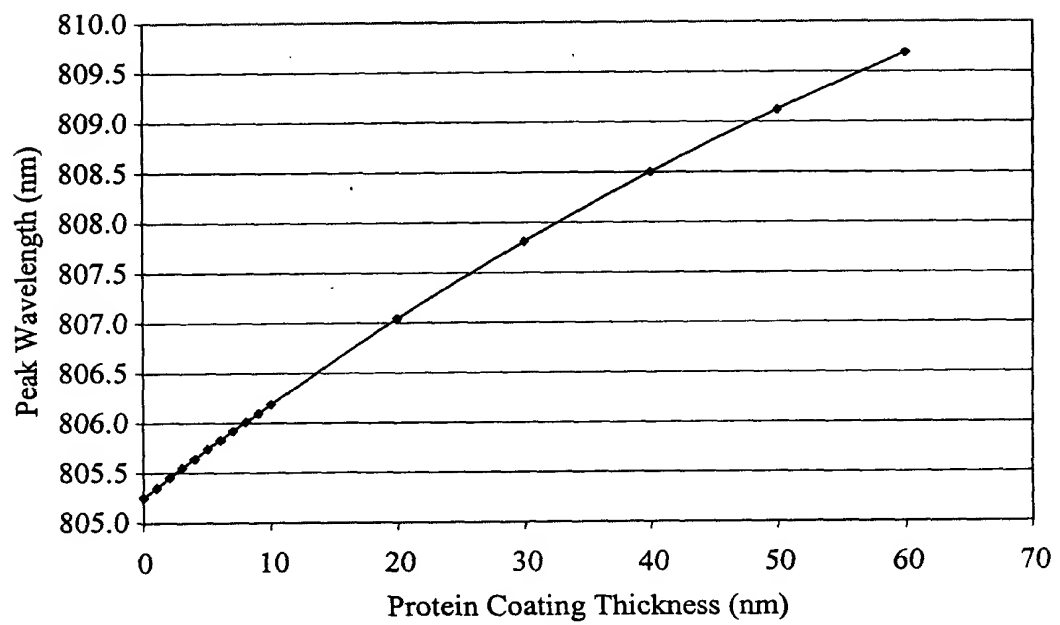


Figure 32





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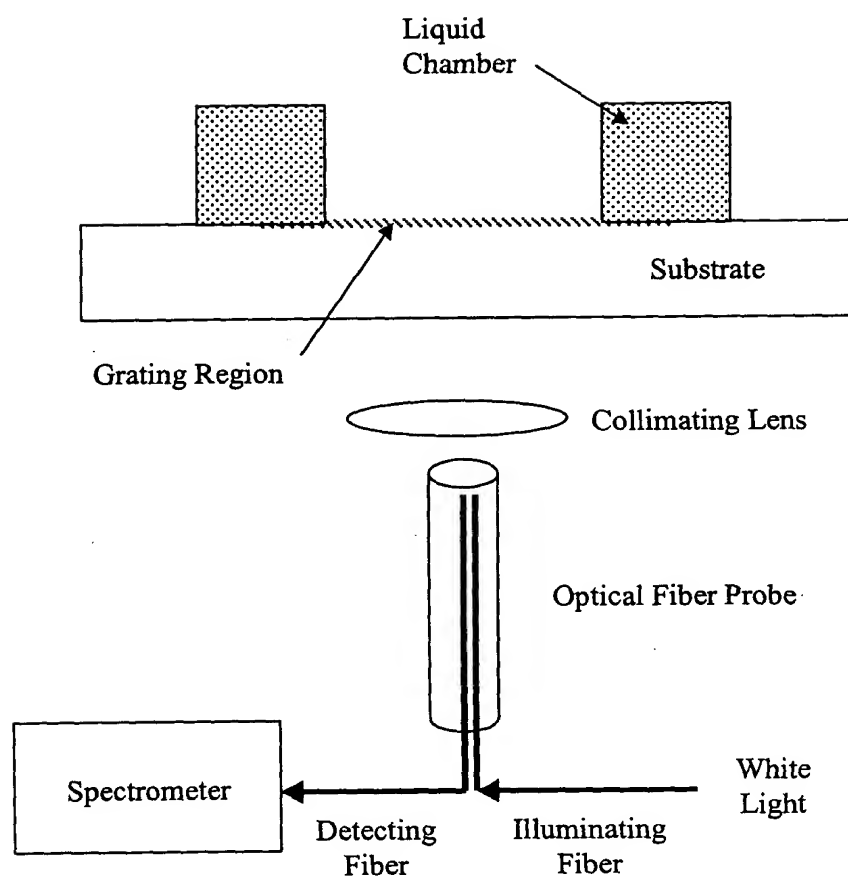


Figure 33

2017-02-23 10:50:00



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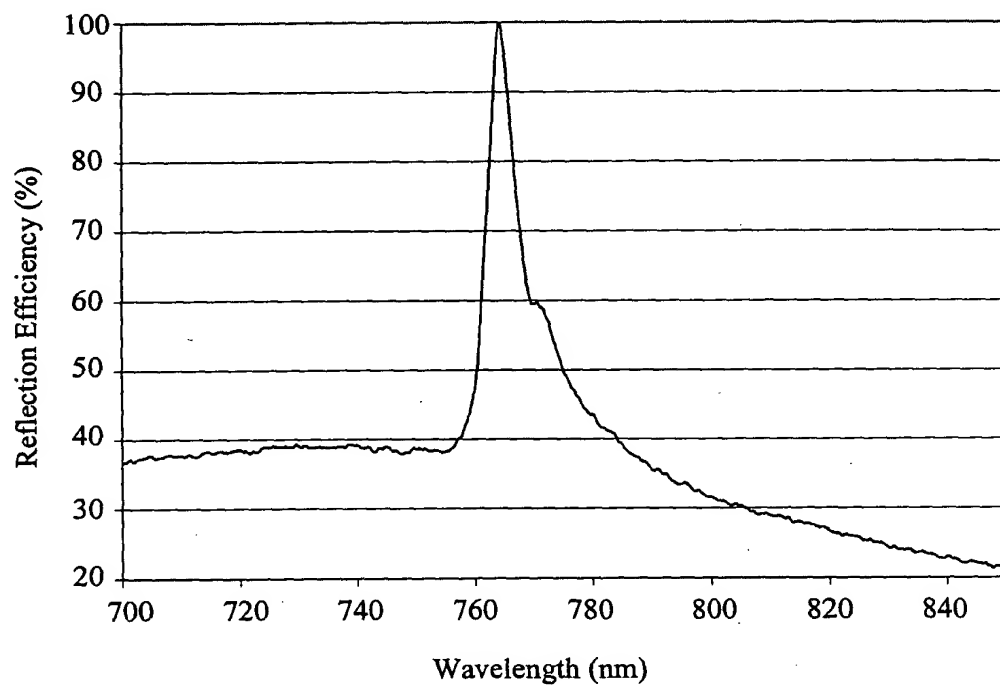


Figure 34



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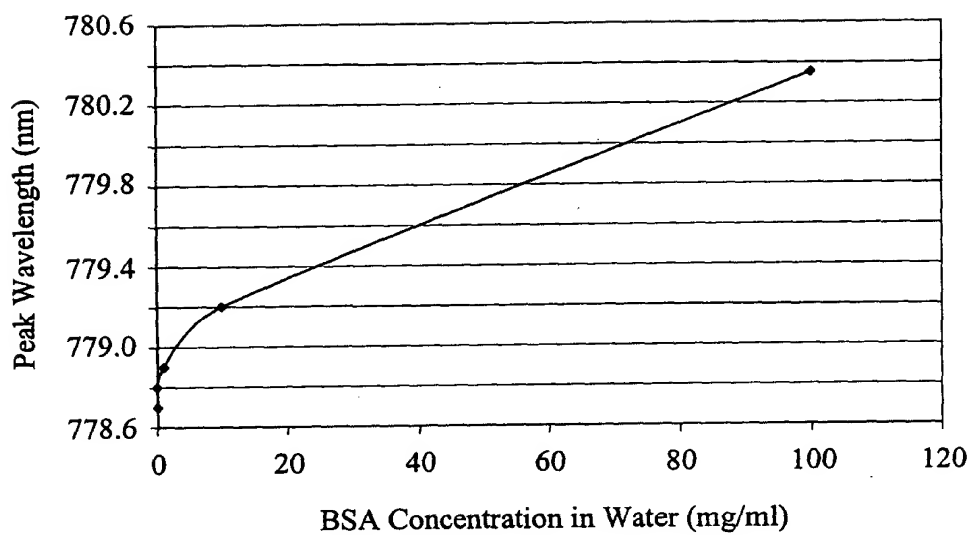


Figure 35

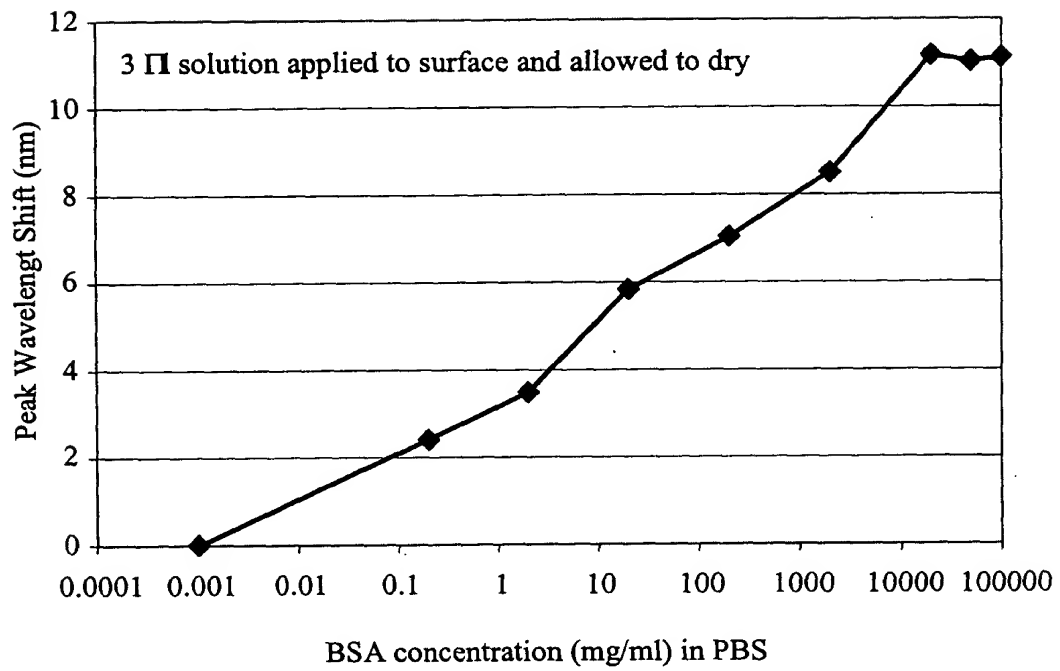


Figure 36

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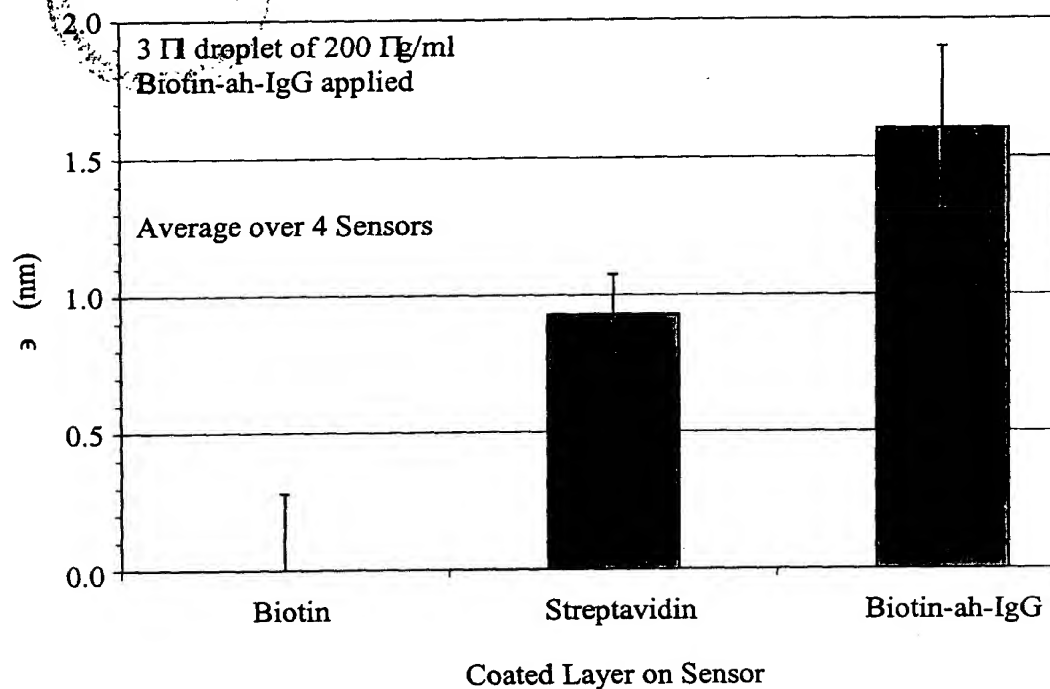


Figure 37A

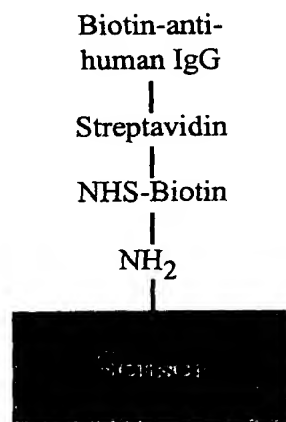


Figure 37B

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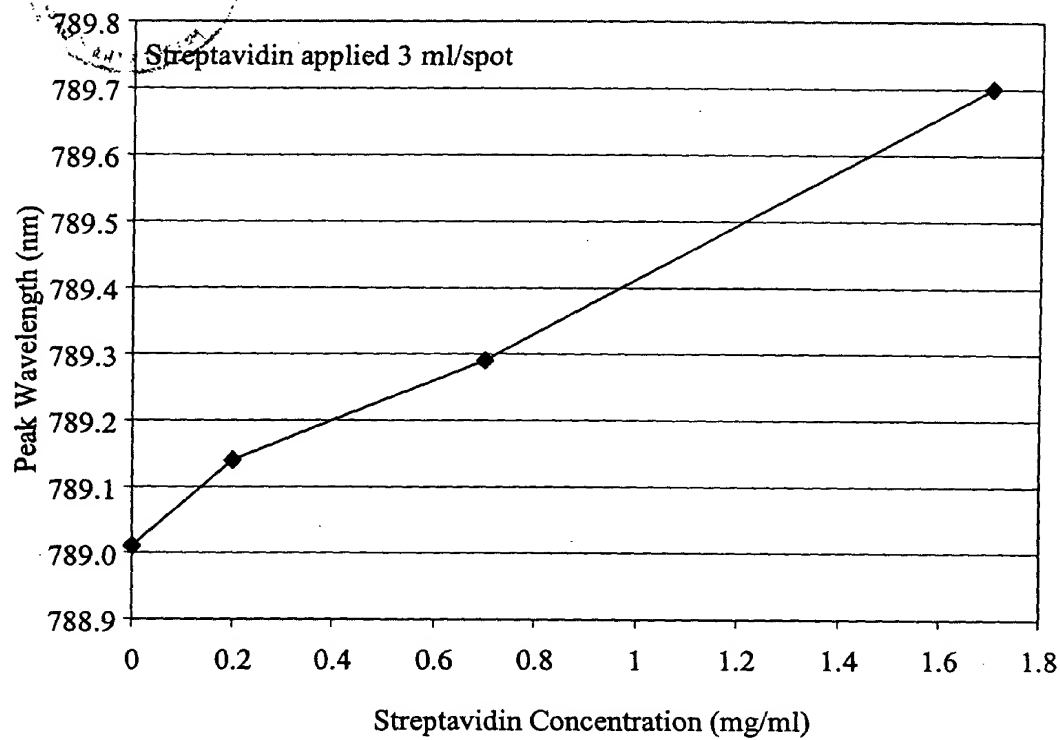


Figure 38A

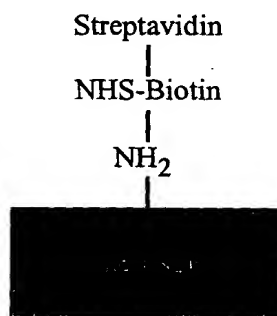


Figure 38B

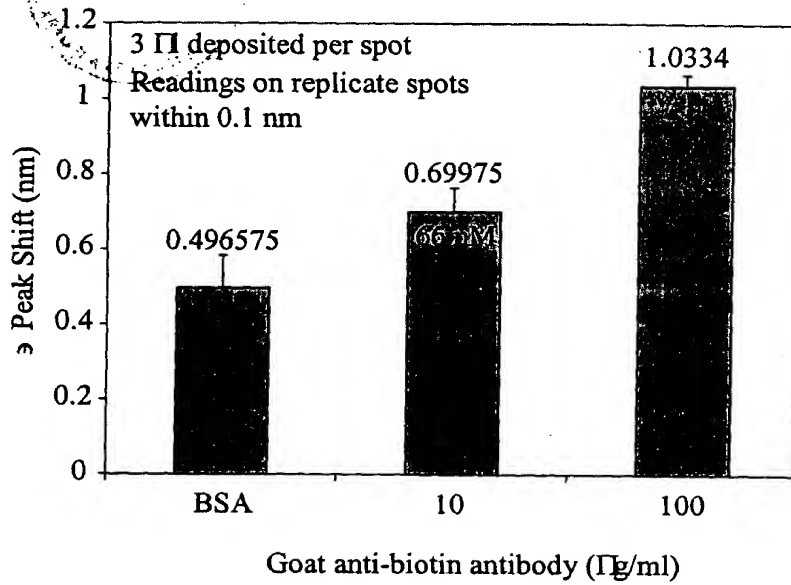


Figure 39A

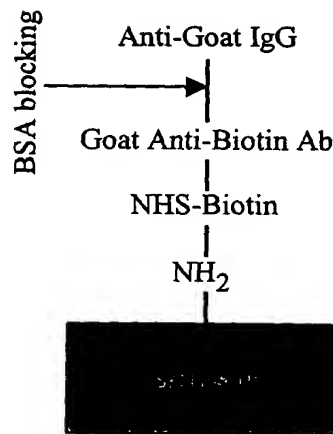


Figure 39B

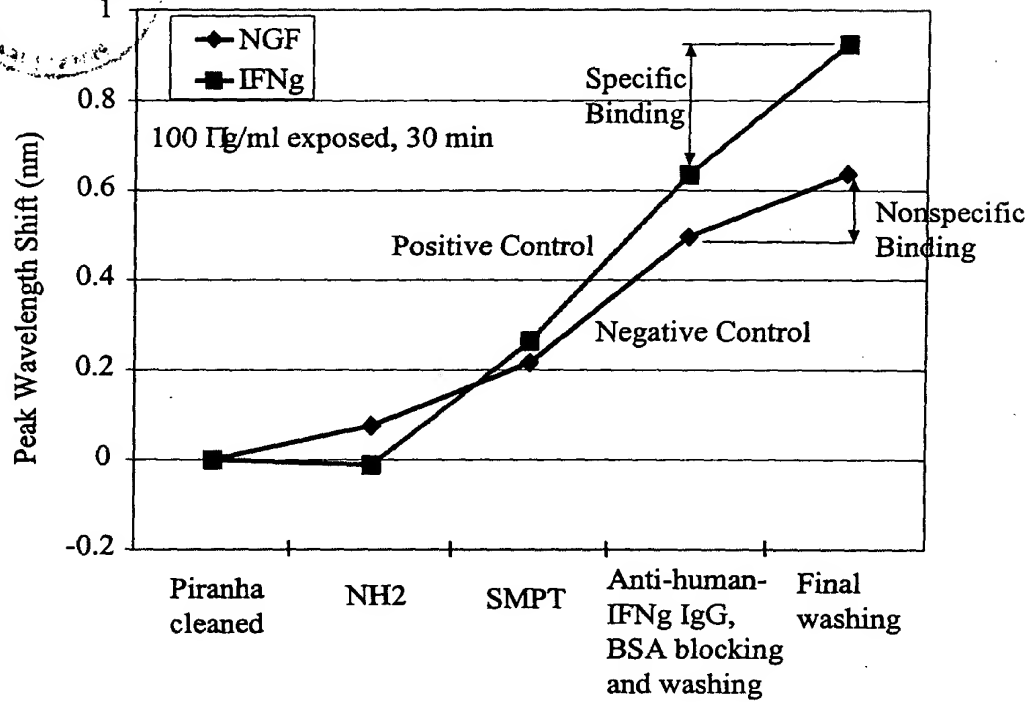


Figure 40A

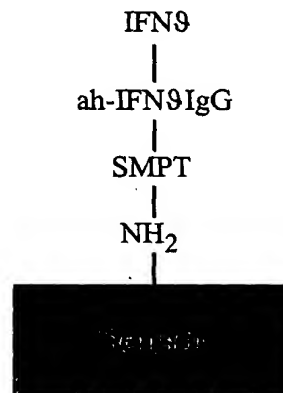


Figure 40B



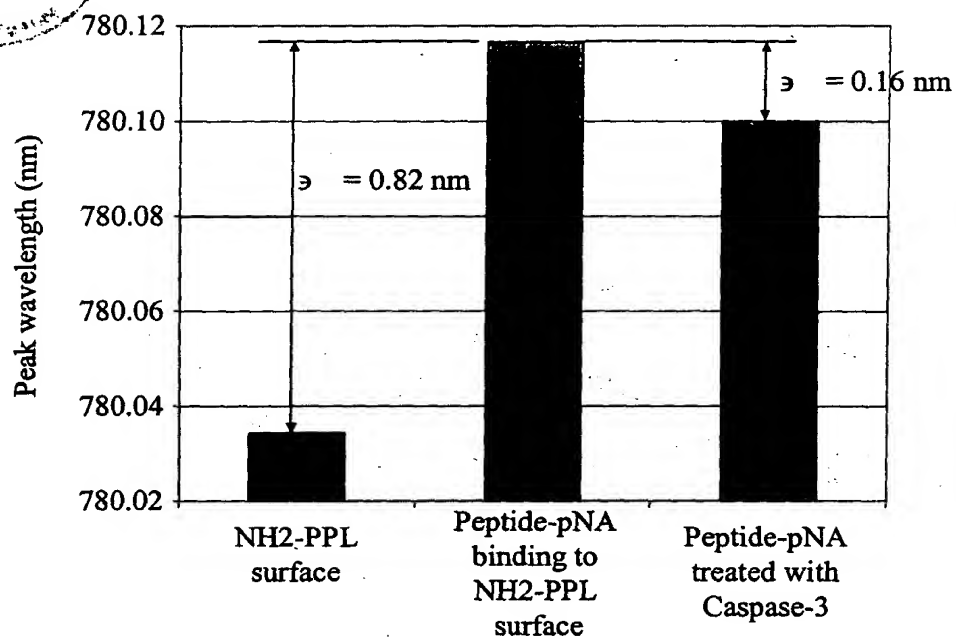


Figure 41A

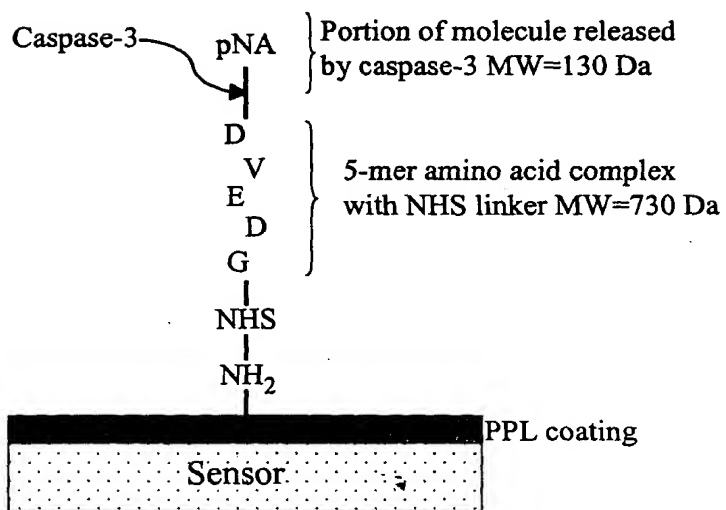


Figure 41B

Measured shifting of the resonant wavelength caused by the binding of various biomolecular layers.

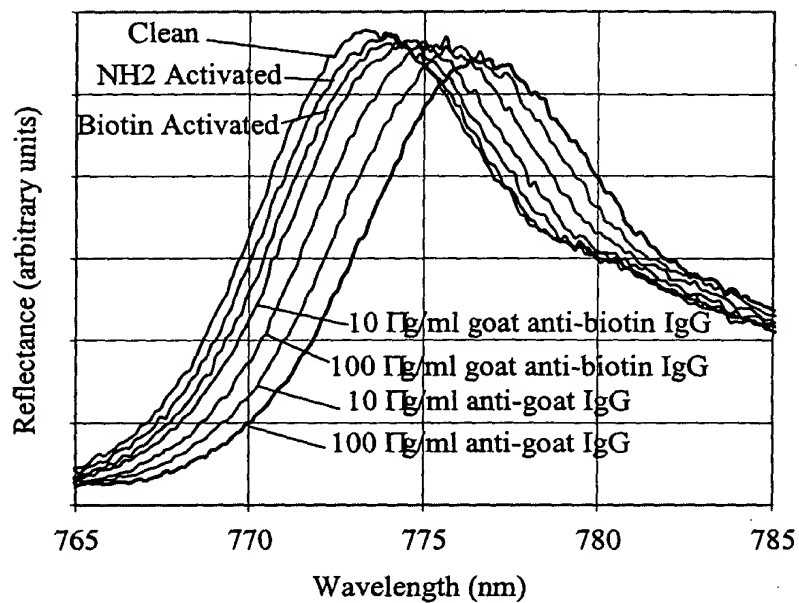


Figure 42A

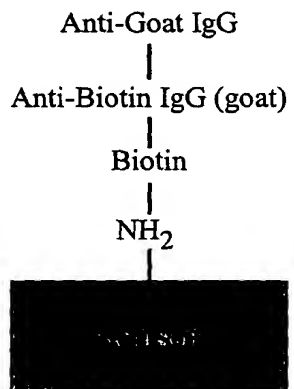


Figure 42B

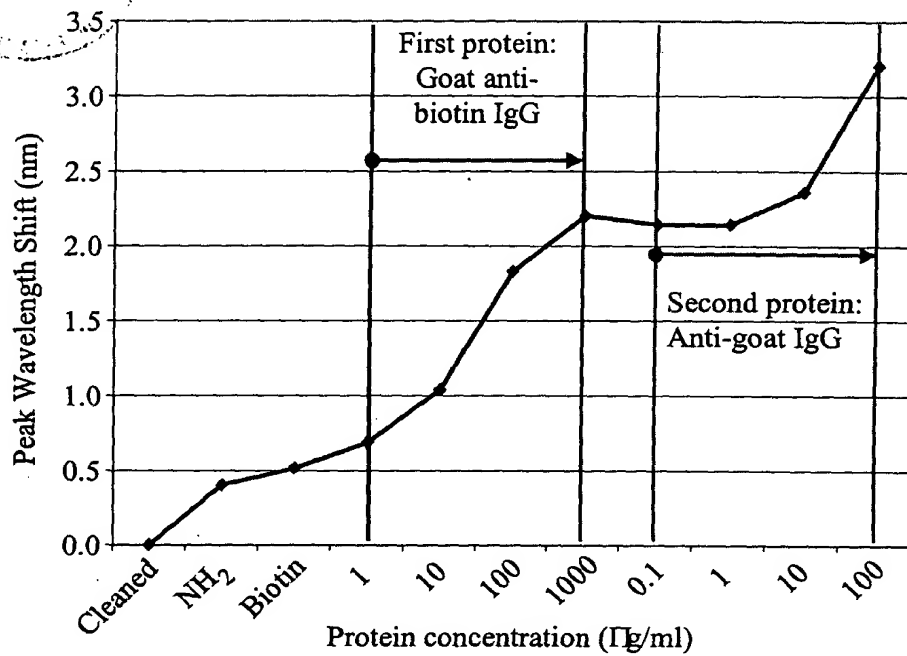


Figure 43A

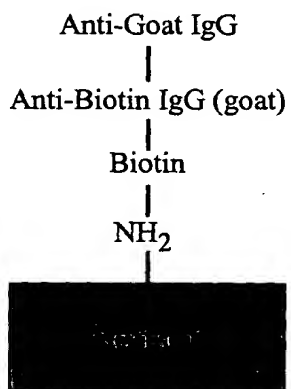


Figure 43B

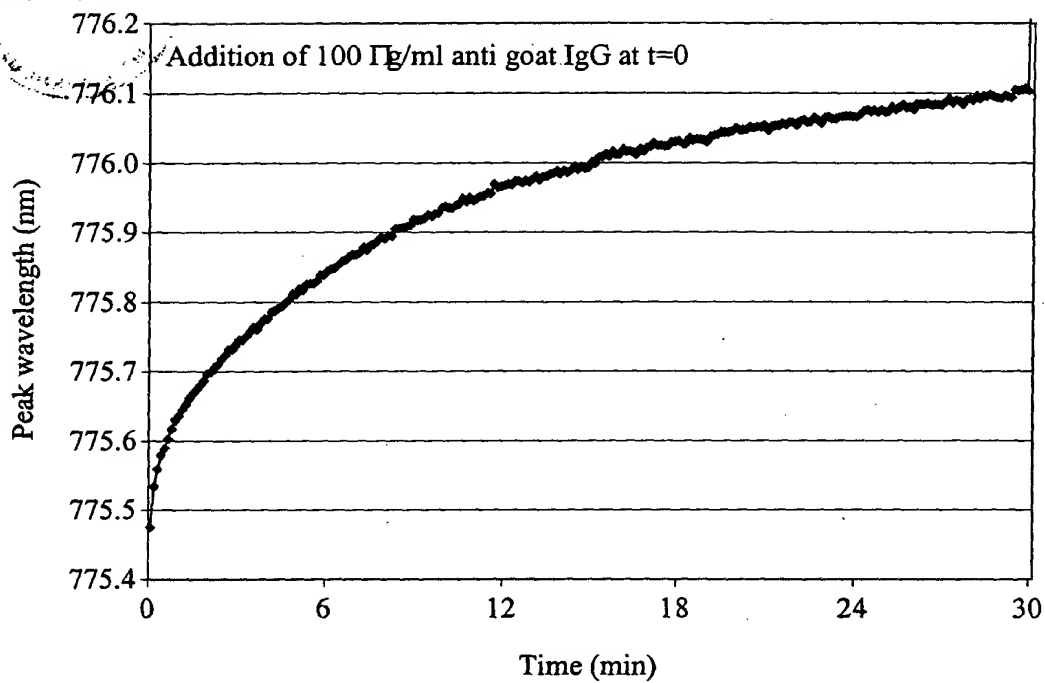


Figure 44A

Anti-Goat IgG  
|  
Anti-Biotin IgG  
(goat)  
|  
Biotin  
|  
NH<sub>2</sub>

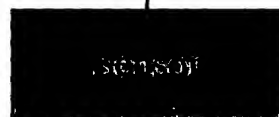


Figure 44B

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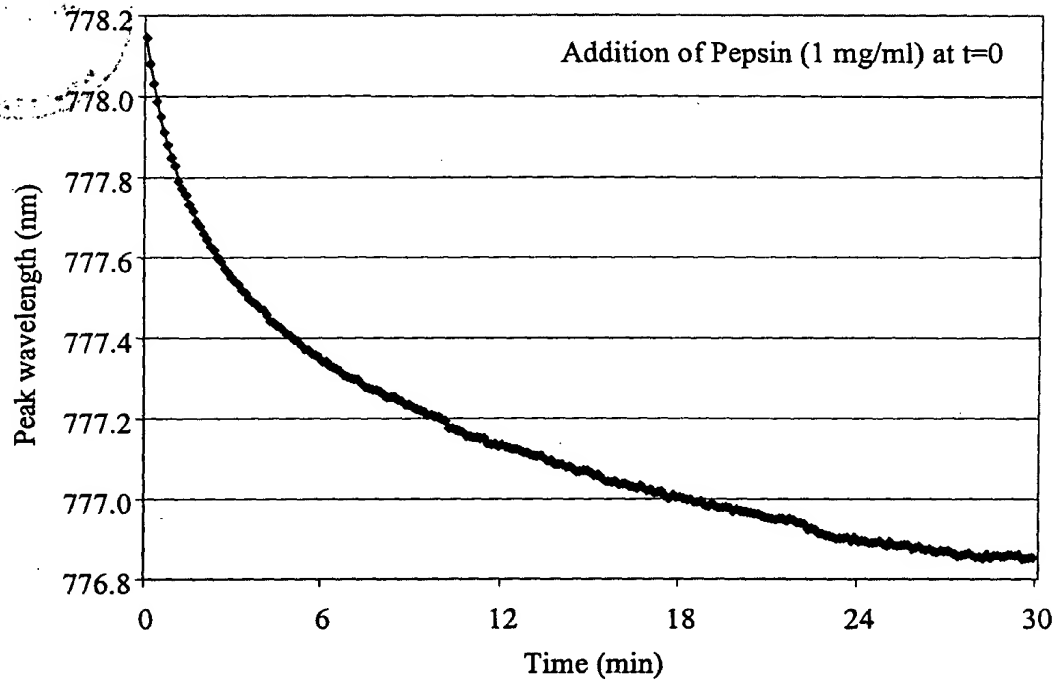


Figure 45A

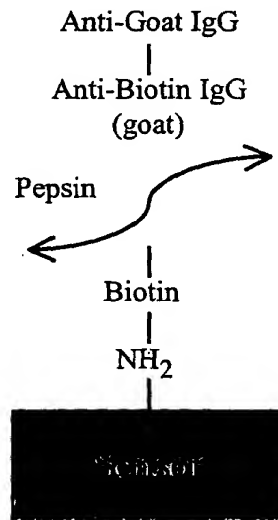


Figure 45B



201700-25406650

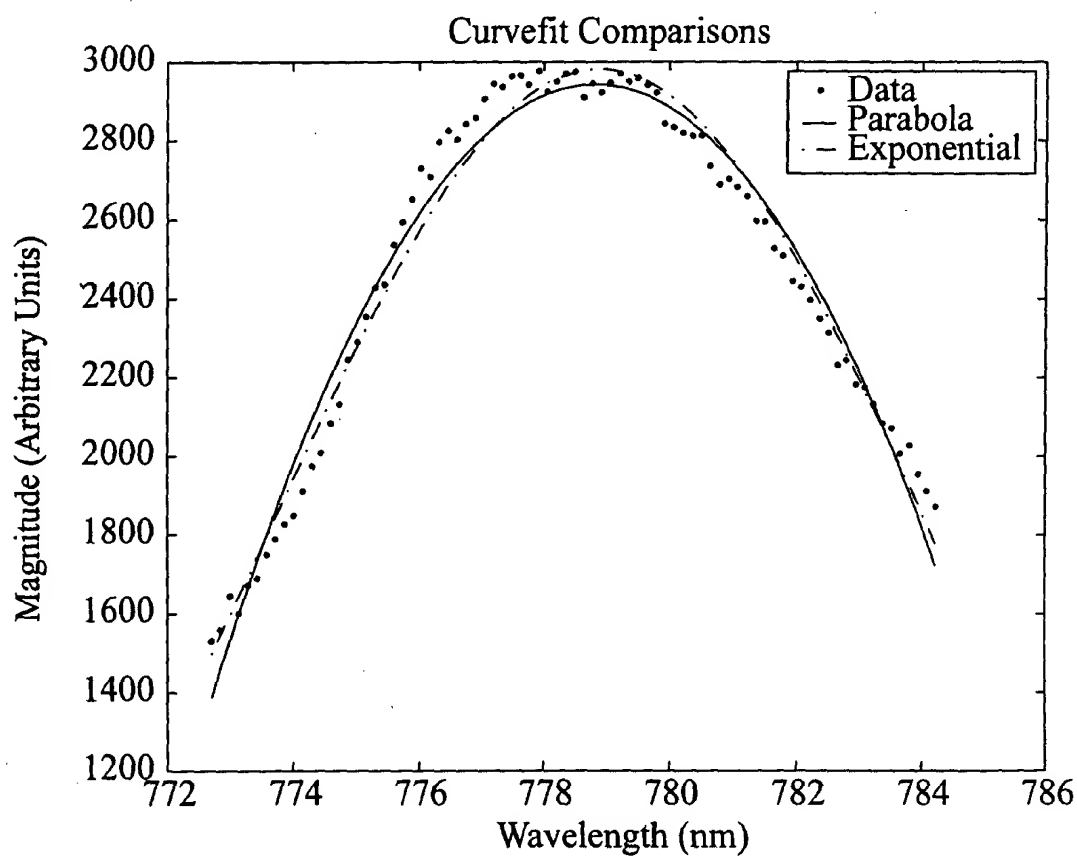


Figure 46

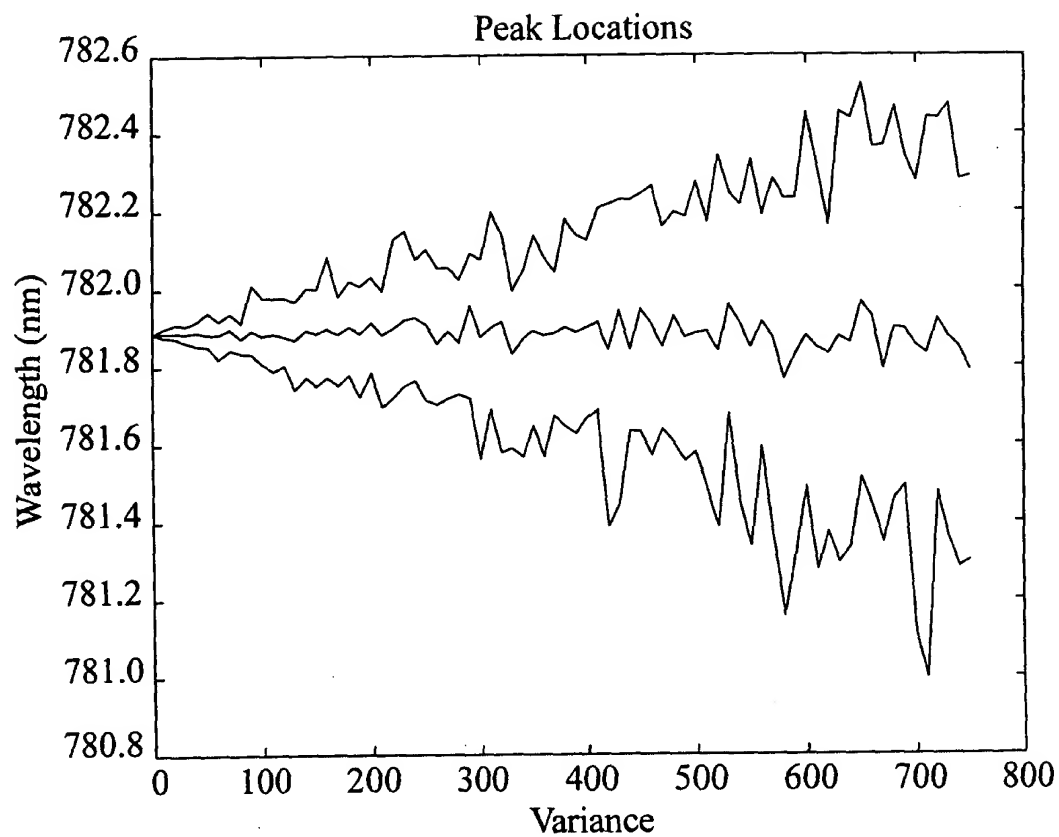
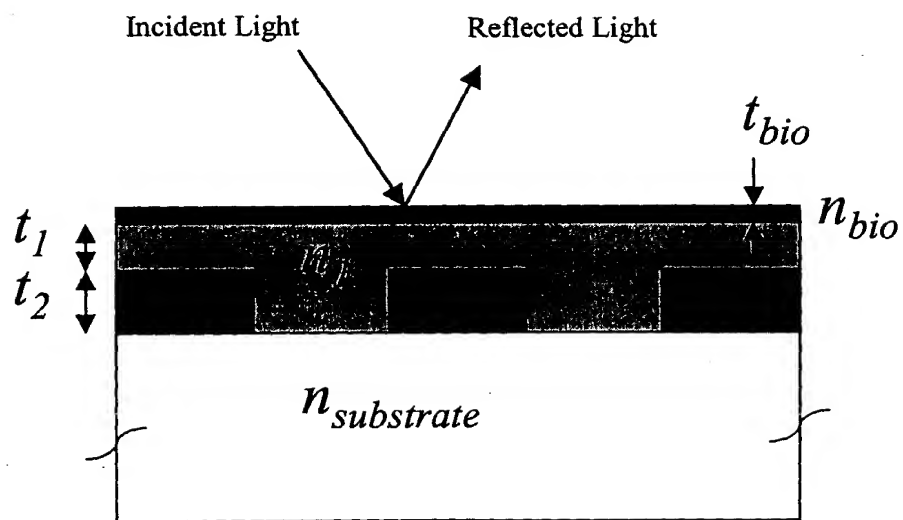


Figure 47



Material 1 = Electrical Insulator (photoresist, epoxy, glass)  
 Material 2 = Indium tin oxide conductor  
 Substrate = Glass

Figure 48





## Concentric Circle Design

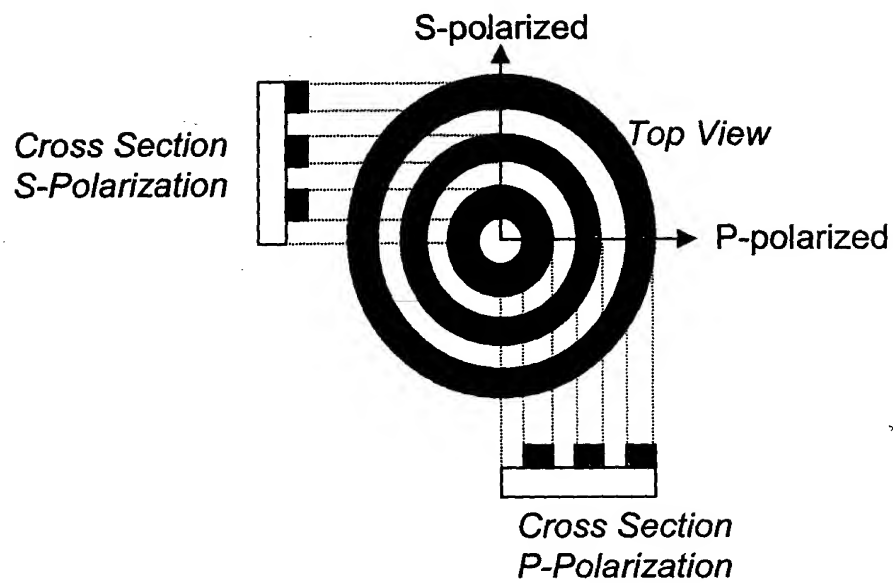


Figure 49

09930352-034402  
201101-25000000



## Hexagonal Grid Design

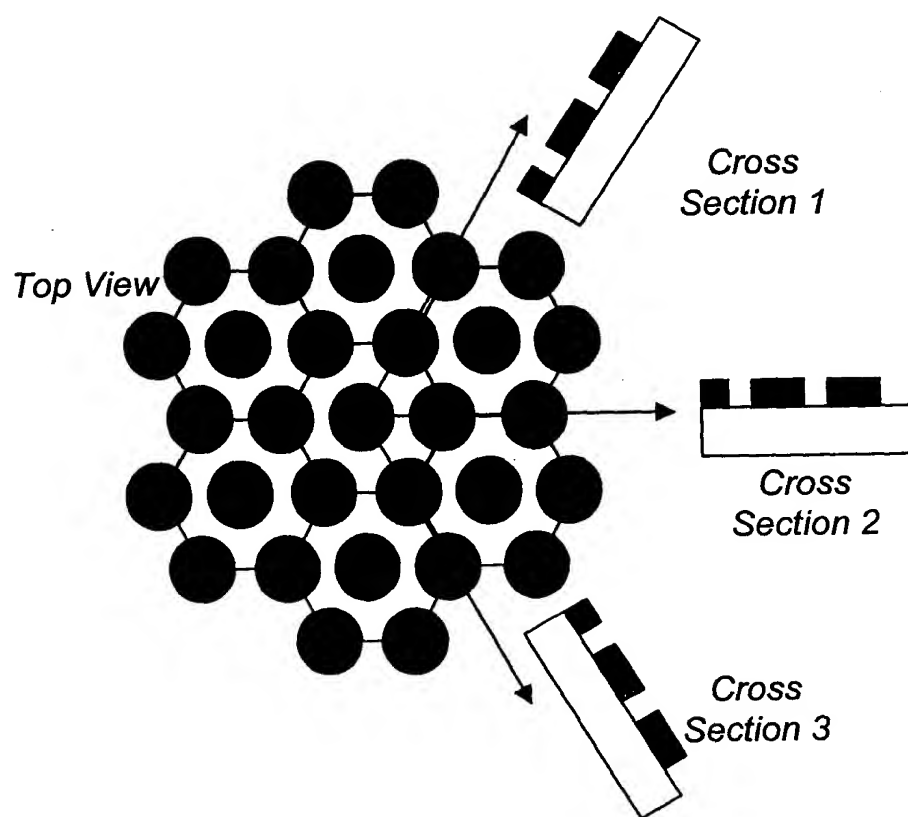


Figure 50

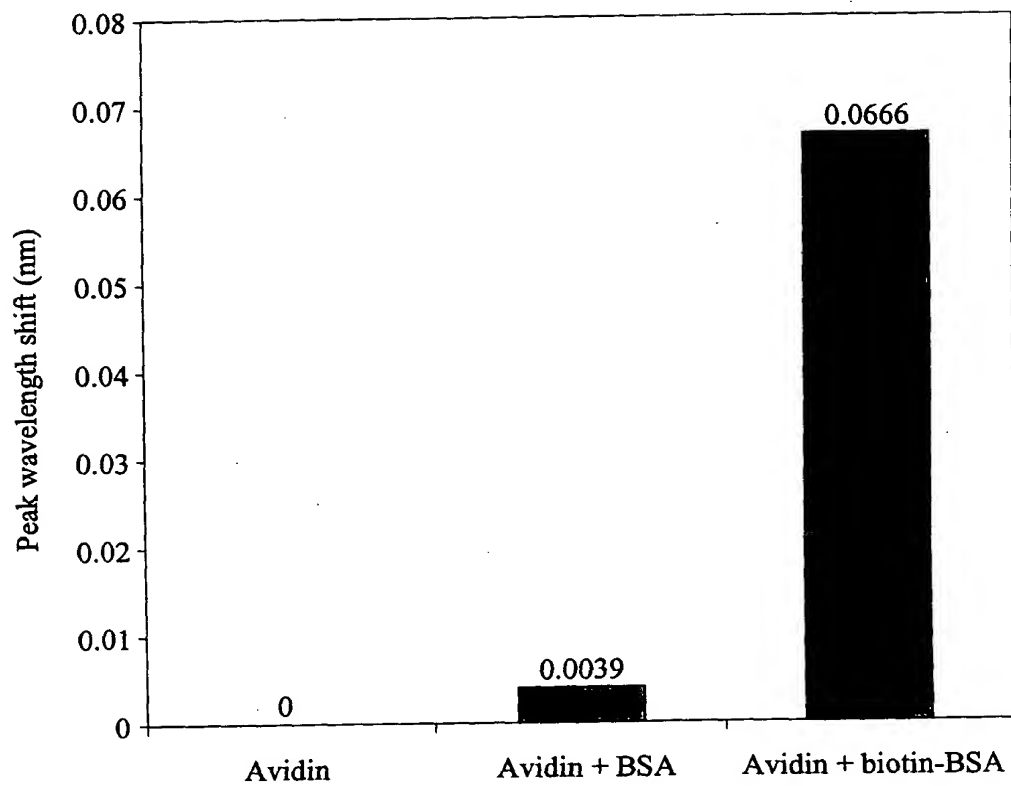


Figure 51

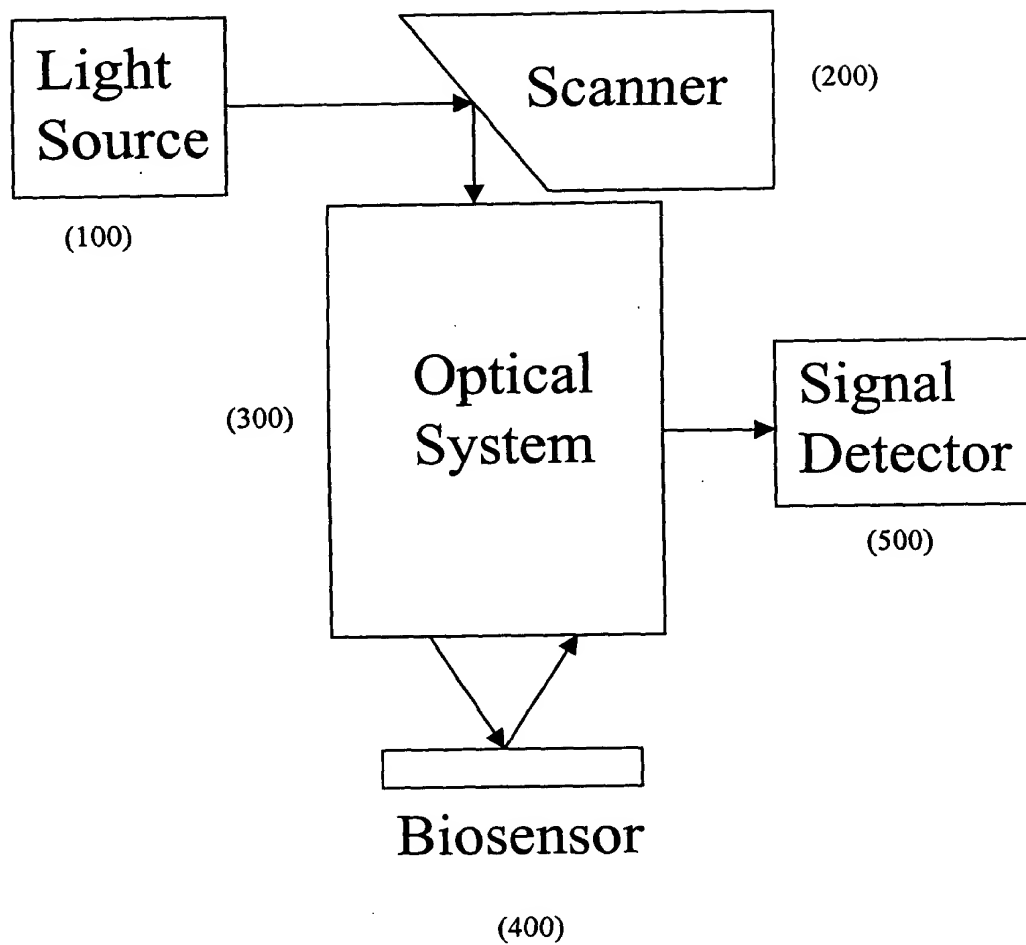


Figure 52

2011-03-01 10:00:00